CHAPTER 1

General introduction

Task shifting has resulted in major changes in the position of the dental hygiene occupation that has been gradually developing into a profession since its establishment by Dr. Alfred C. Fones in 1913. He opened the first school of dental hygiene in Connecticut after developing the concept of a prevention specialist that he referred to as a "dental hygienist" (Fones, 1929). These individuals were first licensed and allowed to practice in Connecticut, which was the first state to allow prophylaxis treatment by a dental hygienist. However, dentists in Connecticut were concerned that the duties given to dental hygienists would lead to additional expanded functions that could become a threat to the economic interests of dentists (Haaland, 1999). Therefore, the state of Connecticut included the regulation of dental hygienists as one part of the Dental Practice Act in 1915. Dentists in other American states followed the Connecticut model with the regulation of dental hygienists becoming part of their own dental practice acts. Since then, the occupation of the dental hygienist has been regulated by dentists in most countries (Johnson, 2009).

Task shifting or skill-mix change between dentists and dental hygienists is implemented all over the world (Johnson, 2009) and may create interprofessional tensions or even polarize the relationship between these two professions (e.g., Adams, 2004; Knevel, Gussy, Farmer & Karimi, 2017; Northcott et al., 2013; Ross & Turner, 2015). Polarization is the tendency of a group to make decisions that are more extreme than the initial viewpoints of its members and can result in conflicting views between professional groups (Aronson, 2010). Persuasive argumentation and social comparison processes contribute to group polarization (Isenberg, 1986). It is a social-psychological response to the perceived threat to an individual's interests, and a number of professionals perceive task shifting as a threat (Knevel et al., 2017). This polarization in professional groups can obstruct or limit task shifting and the utilization of the dental hygienist (Knevel et al., 2017; Kreindler et al., 2012).

It is normal that professions tend to protect their professional boundaries and that a professionalizing occupation such as the dental hygienist pursues a full professional status (Macdonald, 1995). An occupation is a profession when it has its own code of ethics, a single qualifying entry route and certification, a professional association, and monopolization of a particular market (Alvesson, 2000). The degree to which the latter characteristic applies to the dental hygienist primarily depends on national or state jurisdictions (Johnson, 2009). The protection of professional boundaries by a profession may complicate interprofessional collaboration as well as jeopardize patient safety and the provision of high quality patient care (Powell & Davies, 2012).

Interprofessional collaboration amongst professionals from different disciplines is a way to address fragmentation, discontinuity, and lack of receptiveness (Vliet Vlieland & Hazes, 1997). Health care fragmentation occurs when treatment is provided by single health care professionals and is not synchronized (Bodenheimer, Chen & Bennett, 2009). The problem

of discontinuity becomes visible in the culture, structure, and processes whereby the same patient is supported by different agencies in sometimes incompatible ways (Crawford, 2012). Communication between members of different professions, such as lack of receptiveness, can pose problems to patient safety (Tjia et al., 2009). The elimination of unhelpful boundary demarcations between professions and appropriate education and training are factors that promote the success of changing a skill-mix between professions (Sibbald, Shen & McBride, 2004). Even though task shifting could solve workforce shortages and other problems in the health care system (e.g., Brocklehurst & Macey, 2015; Crisp, 2011; Pereira, Bugalho, Bergstrom, Vaz, & Cotiro, 1996), the social-psychological impact of task shifting between dentists and dental hygienists is recognized but has not been thoroughly investigated (Bullock & Firmstone, 2011; Dyer & Robinson, 2008; Northcott et al., 2013). According to the World Dental Federation, "interprofessional collaboration and teamwork is increasingly recognized as a means of achieving higher quality care and enhancing the effectiveness and efficiency of services" (FDI, 2015).

1.1 Task shifting and requirements for its implementation

Task shifting is defined as the rational redistribution of tasks among health workforce teams (World Health Organization, 2008). As contemporary healthcare systems need to be reorganized because the demand exceeds available resources (e.g., Glick et al., 2012; Huang & Finegold, 2013; Kandelman et al., 2012), many governments confront these challenges by implementing task shifting policies as an alternative approach to the organization of health care (Johnson, 2009). These policies enable sharing professional tasks between the original profession and members of other or new occupations or professions with varying degrees of autonomy (Sibbald et al., 2004). It is not known to what degree attitudes among dentists and dental hygienists differ towards an extended scope of dental hygiene practice than from an independent practice.

Several studies of task shifting suggest that appropriately trained substitute professionals are able to deliver at least an equal quality of care (Laurant et al., 2009; Dennis et al., 2009; Laurant et al., 2005; Sibbald et al., 2004). Studies also provide evidence that it can increase efficiency (Bailit, Beazoglou, DeVitto, McGowan & Myne-Joslin, 2012; Richardson, 1999), increase access to services (Bailit et al. 2012; Sibbald, Laurant & Scott, 2006; Campbell, 1996), save costs by reducing training time (Bailit et al. 2012; Thomas et al., 1999), and reduce salary costs (Bailit et al. 2012; Dierick-van Daele et al., 2010; Laurant et al., 2005). Even though task shifting has become increasingly common in medical professions, according to the World Dental Federation, the dental profession has been lagging in this respect (FDI, 2015).

Successful task shifting requires favorable conditions in order to be effective. However, suboptimal conditions do not necessarily mean that task shifiting will not be successful. It means that the environment in which it is implemented is highly complex, and the right requirements for its effectiveness must be aligned (Brocklehurst & Macey, 2015). For instance,

incentives in remuneration systems influence the organization of inputs and production of outputs of dental teams (Brocklehurst et al., 2016). Certain financial incentives can obstruct collaboration and consequently influence treatment within oral health care organizations. Therefore, financial incentives and task shifting should be aligned and professional and social acceptability enhanced. Another example is the alignment of legal protection and liabilities related to task shifting (Colvin et al., 2013). An additional example is the influence of protectionism related to professional boundaries and the organizational environment on the reallocation of tasks which could plausibly hamper the cost-effectiveness of task shifting in practice (Niezen & Mathijssen, 2014). Established professions might try to prevent other professions from expanding their scope of practice and independent practice (e.g., Adams, 2004; Nancarrow & Borthwick, 2005; Norris, 2001; Northcott et al., 2013). These practices are both part of task shifting and can be affected by collaboration between dentists and dental hygienists (e.g., Hopcraft et al., 2008; Abelsen & Olsen, 2008; Northcott et al., 2013).

Interprofessional collaboration and task shifting are interconnected (Colvin et al., 2013), however, this relationship has not been thoroughly studied (Bullock & Firmstone, 2011; Capaciteitsorgaan, 2013). Dental hygienists have been underutilized in interprofessional collaboration, and the utilization that actually occurs has not been well studied (Swanson Jaecks, 2009). This underutilization could be explained by regulations that limit direct access to dental hygienists but also by the social and psychological impact of task shifting. This impact is reflected in the sometimes contradictory attitudes regarding this practice among dentists and dental hygienists (e.g., Blue et al., 2013; Catlett, 2016; Hopcraft et al., 2008). Attitudes towards task shifting are likely to be different depending on whether a profession is a giving or receiving party. Thus far, it is not known to what degree attitudes among dentists and dental hygienists differ regarding an extended scope of dental hygiene practice or those practices that are independent.

1.2 Motives to support or oppose task shifting

It is unclear what issues are considered by dentists and dental hygienists when supporting or opposing task shifting. Their goals can be different depending on their professional position (e.g., Abelsen & Olsen, 2008; Ross & Turner, 2015; Turner, Ross & Ibbetson, 2011). Their attitudes and considerations can both obstruct or enhance it. Attitudes are encouraged by motivation (Piipari, Watt, Jaakkola, Liukkonen, & Nurmi, 2009) while motivation reflects goals that are internal representations of desired states (Austin & Vancouver, 1996). Without positive attitudes towards task shifting, it will be less likely that practitioners will change behaviors that facilitate it in clinical practice (Tuckman, 1999). The absence of motivation will produce a similar outcome: task shifting will rarely be facilitated in clinical practice. Without motivation, goal-directed behavior is nonexistent (Austin & Vancouver, 1996).

Negative economic motives of dentists to obstruct task shifting might not be justified but are understandable. When dentists believe they might lose control over economic resources, they experience an existential threat. The professional position of dentists was perceived to be threatened by the introduction of the dental hygienist, according to dentists in Connecticut (Fones, 1929; Haaland, 1999).

Quality of care can be an argument for limiting task shifting to the dental hygienist. However, no clear evidence exists that dental hygienists are a threat to patient safety and are not competent enough to autonomously treat their own patients. Moreover, several studies provide evidence that dental hygienists are competent professionals (e.g., Brocklehurst et al., 2016; DeAngelis & Goral, 2000; Dyer et al., 2014; Macey et al., 2015; Macey, Glenny & Brocklehurst, 2016). It is likely that several issues are involved when considering supporting or opposing task shifting.

1.3 Expectations, self-image and occupational stereotypes

It is not clear to what degree self-image and occupational stereotypes of dentists and dental hygienists correspond with those of students before entering an interprofessional program. Supporting or opposing task shifting by dentists and dental hygienists could also be explained by role expectations which are sometimes based on a lack of knowledge among dentists with regard to changing the dental hygienist role (e.g., McComas & Inglehart, 2016; Moffat & Coates, 2011; Gillis & Parker, 1996; Knevel et al., 2017; Muroga, Tsuruta & Morio, 2015; Pervez, Kinney, Gwozdek, Farrell, & Inglehart, 2016). Dental hygiene is an emerging profession; however, occupational stereotypes change slowly (Lassonde & O'Brien, 2013; McLean & Kalin, 1994). In other words, some dentists still regard the dental hygienist as an auxiliary, which does not reflect the current and formal status of the dental hygienist in most countries. However, such perceptions do influence behavior and the willingness of dentists to share basic dental tasks. Stereotypes reflect expectations and beliefs about the characteristics of out-group members (Denmark, 2010; Fiske, 1998). Occupational stereotypes can also be based on gender (McLean & Kalin, 1994). The dental hygiene occupation is female-dominated while dentistry is male-dominated in most countries (e.g., Kitchener & Mertz, 2012; Luciak-Donsberger, 2003; Mariño, Barrow & Morgan, 2014). Gender stereotypes play a role in the social interaction between dentists and dental hygienists and can affect interprofessional collaboration (Inglehart, 2013). This becomes visible with status differences between men and women that are also related to the established order of the occupational status hierarchy within health care (Bell, Michalec & Arenson, 2014). Since the professional socialization of dental and dental hygiene students is often separate, mutual role expectations and occupational stereotypes among these students are sustained or can even be strengthened (Vanderbilt, Isringhausen & Bonwell, 2013).

The claim or disclaim, affirmation or disaffirmation of professional position, social characteristics, and gender can influence professional identities that guide professional behavior (Holmes, 2001; Hurd, 2010). Therefore, occupational stereotypes are more likely to continue to exist when uni-professional education is not complemented with interprofessional education (Freeth, Hammick, Reeves, Koppel, & Barr, 2005) and interfere with collaboration by impacting communication between groups (Barnes, Carpenter & Dickinson, 2000; Carpenter, 1995; Carpenter & Hewstone, 1996; Hean, MacLeod, Adams, & Humphris, 2006). Expectations regarding tasks, roles, and collaboration are learned by dentists and dental hygienists during their professional socialization which already occurs at the undergraduate level (Brim, 1968). The professional identity or self-image of students can be based on occupational stereotypes even before entering their future occupation (McLean & Kalin, 1994).

1.4 Socialization, identity, task distribution and collaboration

It is not clear whether facilitating professional identity formation related to interprofessionality could enhance interprofessional task distribution and improve interprofessional collaboration. Interprofessional programs during undergraduate training can facilitate socialization between members of two or more professions (Olson & Bialocerkowski, 2014). Professional socialization is a social learning process during which skills, attitudes, and behaviors related to their professional role are learned (Blue, Phillips, Born, & Lopez, 2011). This socialization begins already at the 'anticipatory socialization phase' (Scholarios, Lockyer & Johnson, 2003). During this phase, individuals select their career based on the attitudes and expectations regarding their occupation of choice. The most influential people for making a career choice among dental hygiene students are dental hygienists, dentists, and mothers (Monson & Cooper, 2009). The career choice of dental students is mostly influenced by parents, dentists, and family members in a medical or dental profession (Anbuselvan et al., 2013). Therefore, professional socialization of dental and dental hygiene students begins before they have even entered their undergraduate training. Before and during undergraduate training, they observe dentists, dental hygienists, and members of the teaching staff (e.g., Ashar & Ahmad, 2014; Masella, 2006; Monson & Cooper, 2009). Thus, students learn their professional identity not just by the formal content of a curriculum but also by the informal and implicit influences of the teaching staff. This is known as the 'hidden curriculum' (Hafferty, 1998; Hafferty & Franks, 1994). This curriculum is defined by Lempp & Seale (2004) as "the set of influences that function at the level of organizational structure and culture including, for example, implicit rules to survive the institution such as customs, rituals, and taken for granted aspects". The potential negative influence of the hidden curriculum on interprofessional collaboration is even greater when a curriculum does not provide opportunities to counter-balance this with interprofessional contact between students (Freeth et al., 2005). The contact hypothesis or intergroup contact theory of Allport (1954) has been described as one of the best strategies to employ to improve intergroup relationships (Brown & Hewstone, 2005; Wright, 2009). The premise of his theory states that interpersonal contact is an effective way to reduce prejudice

between members of different groups (Allport, 1954). For this reason, the intergroup contact theory is one of the most popular theories applied in interprofessional education (Hean & Dickinson, 2005).

Another popular theory in interprofessional education is the social identity theory (Pecukonis, 2014). This theory, introduced by Tajfel and Turner (1979), describes how individuals categorize people or groups as in-group or out-group through a social categorization process (Turner, 1987; Turner & Reynolds, 2010; Tajfel & Turner, 1979). A defined sense of professional identity is created by a reciprocal and reinforcing relationship between experiences of professional inclusivity and social exclusivity (Weaver et al., 2011). A second theory in the social identity approach is the identity theory (Owens, Robinson & Smith-Lovin, 2010; Stets & Burke, 2000). The identity theory has been applied much less in interprofessional education compared to the social identity theory, however, it can be considered as being complementary. These two theories have different approaches to the social self but are hardly ever cross-referenced and seem to occupy separate realities (Hogg, Terry & White, 1995; Owens et al., 2010; Stets & Burke, 2000). The identity theory describes how stable and internalized social identities are formed and how these identities guide behavior (Owens et al., 2010). Thus, the identity theory is focused on the intrapersonal level in which individuals have several social identities between which they choose depending on the social situation or context. This becomes visible in the phenomenon of "identity mobility" which is the shift between social identities depending on social context and the motives of the actor (e.g., Finn, Garner & Sawdon, 2010; Ginsburg, Regehr & Lingard, 2003; Lingard, Garwood, Szauter, & Stern, 2001).

Strong professional identities may perpetuate hierarchical disciplinary boundaries (e.g., Fitzgerald & Teal, 2004; Langendyk, Hegazi, Cowin, Johnson, & Wilson, 2015). For this reason, several authors suggest that the formation of an interpofessional identity will enhance interprofessional collaboration (e.g., Hammick, Freeth, Copperman, & Goodsman, 2009; Khalili et al., 2013; Langendyk et al., 2015). According to Hammick et al. (2009), an interprofessional identity consists of three components: knowledge with regard to appropriate professional actions, professional competence, and professional conduct (including appropriate attitudes and values). However, it is unclear whether it is separate from professional identity.

The construct of 'interprofessional identity' is relatively new, and it is not known whether this concerns a separate social identity or whether it is an integrated part of professional identity. According to the identity theory, an individual changes his identity preferences and corresponding behavior depending on a change in social context (Owens et al., 2010). If professional identity and interprofessional identity are separate and co-existing social identities, than one of them will be more salient than the other. Such salience hierarchy could interfere with effective professional performance. According to the social identity theory, a professional identity reflects a (psychological) distinctiveness between professional

in-groups and professional out-groups (Tajfel & Turner, 1979). Even though professional distinctiveness can frustrate interprofessional collaboration by drifting away from it, it also justifies interprofessional collaboration because of the complementary contributions of different disciplines. When there is no professional distinctiveness between different professions, there is no added value. Team members with no added value are redundant. It is for this reason that it is important to know the added value of others' professions (role, expertise, and competencies) and simultaneously shape one's own professional uniqueness as added value to the interprofessional team or alliance (Kasperski, 2000). Interprofessional collaboration facilitates a synergistic performance based on grouped knowledge and skills. Yet, the synergistic performance can be limited or even obstructed by intergroup processes. According to the paradox of Whittington (2003), professional identity seems to conflict with the principles of interprofessional collaboration because professional uniqueness contradicts the tendency to share with or be similar to other professions.

Profession-specific tasks are inherently related to role expectations and professional self-definition or professional identity (Caza & Creary, 2016; Chreim, Williams & Hinings, 2007; Hornby & Atkins 2000; Pirrie, Hamilton & Wilson, 1999). The manner in which individuals perceive their professional identity will influence their interpretations and actions in a work-related context (Chreim et al., 2007; Goodrick & Reay, 2011; Pratt, Rockmann & Kaufmann, 2006). In turn, a professional identity is constructed by social interaction (Bechky, 2011; Binder, 2007; Hallett et al., 2009). Thus, role expectations have a personal and interpersonal dimension (Ohlen & Segestebn, 1998). The interpersonal dimension becomes prominent in interactions between members of different professions. Interactions between dentists and dental hygienists can reflect a polarization caused by task shifting (Knevel et al., 2017), and occupational stereotypes change slowly (Beggs & Dolittle, 1993). This also includes stereotypical thoughts about scope of practice and corresponding competences. Perceptual differences regarding professional tasks and role expectations can enhance many uncertainties between and within professionals (Douglas & Ryman, 2003; Workman, 1996). When the formation of a professional identity that includes beliefs and commitment regarding interprofessional collaboration can be facilitated, it could also change perceptual differences regarding professional tasks and expectations. According to the World Dental Federation, interprofessional education must enable the oral health team to acquire a different mix of skills and competencies that are needed for interprofessional collaboration (FDI, 2015).

The purpose of this dissertation is to explore the social psychological impact of task shifting between dentists and dental hygienists and to develop and investigate the effect of an intervention that can enhance interprofessional task distribution and interprofessional collaboration by facilitating interprofessional team formation.

Overview of studies

The purpose of the study of Chapter 2 is to compare attitudes of dentists and dental hygienists regarding an extended scope and independent dental hygiene practice.

The purpose of the study of Chapter 3 is to explore the reasons for the opinions of dentists and dental hygienists regarding an extended scope of dental hygiene practice and to explore profession related explanatory factors.

The purpose of the study of Chapter 4 is to determine to what degree student perceptions of dentist and dental hygienist occupational stereotypes (assertiveness, dominance, and respectfulness) are different and to what degree they identify with these occupational stereotypes. Additionally, the relationship between gender and occupational stereotypes is investigated.

The purpose of the study of Chapter 5 is to investigate whether intergroup comparison of interprofessional interaction can change the relative dominance of one profession (professional position) and reduce interprofessional hierarchy in mixed profession groups.

The purpose of the study of Chapter 6 is to investigate the perceived scope of practice of dental and dental hygiene students. Furthermore, to determine whether distinguished interprofessional task distribution can change with an educational intervention comprising the combination of group-based performance feedback, intergroup comparison, and intergroup competition between mixed profession groups.

References

Abelsen, B. & Olsen, J.A. (2008). Task division between dentists and dental hygienists in Norway. *Community Dentistry and Oral Epidemiology,* 36(6), 558-566.

Adams, T.L. (2004). Inter-professional conflict and professionalization: dentistry and dental hygiene in Ontario. *Social Science & Medicine,* 58, 2243–2252.

Allport, G.W. (1954). *The nature of prejudice.* Cambridge, MA: Perseus Books.

Anbuselvan, G.P., Gokulnathan, S., Praburajan, V., Rajaraman, G., Kumar, S.S., & Thagavelu, A. (2013). A study among dental students regarding the factors influenced dental students to choose dentistry as career. *Journal of Pharmacy And Bioallied Sciences,* 5(1), S36-38.

Alvesson, M. (2000). Social Identity and the Problem of Loyalty in Knowledge Intensive Companies. *Journal of Management Studies,* 27(8), 1101-1123.

Aronson, E. (2010). *Social Psychology.* Upper Saddle River, NJ: Prentice Hall. Ashar, A. & Ahmad A. (2014). Developing professionalism: dental students' perspective. *Journal of the College of Physicians and Surgeons Pakistan,* 24(12), 902-907.

Austin, J.T. & Vancouver, J.B. (1996). Goal constructs in psychology: Structure, process, and content. *Psychological Bulletin,* 120(3), 338-375.

Bailit H.L., Beazoglou T.J., DeVitto J., McGowan, T., & Myne-Joslin, V. (2012). Impact of Dental Therapists on Productivity and Finances III. FQHC-Run. School-Based Dental Care Programs. *Journal of Dental Education,* 76 (8), 1077-1081.

Barnes, D., Carpenter, J., & Dickinson, C. (2000). Interprofessional education for community mental health: Attitudes to community care and professional stereotypes. *Social Work Education,* 19, 565–583.

Bechky, B.A. 2011. Making organizational theory work: Institutions, occupations, and negotiated orders. Organization Science, 22(5): 1157–1167.

Beggs, J. & Dolittle, D. (1993). Perceptions now and then of occupational sex typing: A replication of Shinar's 1975 study. *Journal of Applied Social Psychology,* 23, 1435-1453.

Bell, A.V., Michalec, B., & Arenson, C. (2014). The (stalled) progress of interprofessional collaboration: the role of gender. *Journal of Interprofessional Care,* 28(2), 98-102.

Binder, A. (2007). For Love and Money: Organizations' Creative Responses to Multiple Environmental Logics. *Theory and Society,* 36, 547–571.

Blue, C.M., Funkhouser, D.E., Riggs, S., Rindal, D.B., Worley, D., Pihlstrom, D.J., Benjamin, P., Gilbert, G.H., & National Dental PBRN Collaborative Group (2013). Utilization of nondentist providers and attitudes toward new provider models: findings from the National Dental Practice-Based Research Network. *Journal of Public Health Dentistry,* 73(3), 237-244.

Blue, C., Phillips, R., Born, D., & Lopez, N. (2011). Beginning the socialization to a new workforce model: dental students' preliminary knowledge of and attitudes about the role of the dental therapist. *Journal of Dental Education,* . 2011 Nov;75(11):1465-75.

Bodenheimer, T., Chen,. E., & Bennett, H.D. (2009). Confronting the growing burden of chronic disease: can the U.S. health care workforce do the job? *Health Aff (Millwood)*, 28(1), 64-74.

Borgatti, S.& Cross, R. (2003). A relational view of information seeking and learning in social networks. *Management Science,* 49, 432-445.

Brim, O.G. Jr. (1968). Adult socialization. In Clausen, J.A. (Ed.), *Socialization and society.* (pp. 182-226). Boston: Little Brown.

Brocklehurst, P., Birch, S., McDonald, R., Hill, H., O'Malley, L., Macey, R., & Tickle, M. (2016). Determining the optimal model for role substitution in NHS dental services in the UK: a mixed-methods study. *Health Services and Delivery Research*, 4(22).

Brocklehurst, P.& Macey, R. (2015). Skill-mix in preventive dental practice--will it help address need in the future? *BMC Oral Health*, 15(1), S10.

Brocklehurst, P., Pemberton, M.N., Macey, R., Cotton, C., Walsh, T., & Lewis, M. (2015). Comparative accuracy of different members of the dental team in detecting malignant and non-malignant oral lesions. *British Dental Journal,* 8;218(9): 525-529.

Brown, R., & Hewstone, M. (2005). An integrative theory of intergroup contact. In M.P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 37, pp. 255-343). San Diego, CA: Elsevier Academic Press.

Bullock, A. & Firmstone, V. (2011). A professional challenge: the development of skill-mix in UK primary care dentistry. *Health Services Management Research,* 24(4), 190-195.

Campbell, J. (1996). The reported availability of general practitioners and the influence of practice list size. *British Journal of General Practice,* 46, 465-468.

Carpenter, J. (1995). Interprofessional education for medical and nursing students: Evaluation of a programme. *Medical Education,* 29, 265-272.

Carpenter, J. & Hewstone, M. (1996). Shared learning for doctors and social workers: Evaluation of a programme. *British Journal of Social Work,* 26, 239–257.

Catlett, A. (2016). Attitudes of Dental Hygienists towards Independent Practice and Professional Autonomy. *Journal of Dental Hygiene*, 90(4), 249-256.

Caza, B.B., & Creary, S. J. (2016).The construction of professional identity [Electronic version]. Retrieved December 27, 2016, from Cornell University, SHA School site: http://scholarship.sha.cornell.edu/articles/878

Crawford, K. (2012). Interprofessional collaboration in social work practice. London: SAGE.

Chreim, S., Williams, B.E., & Hinings, C.R. (2007). Interlevel Influences on the Reconstruction of Professional Role Identity. *Academy of Management Journal*, 50, 1515–1539.

Crisp, N. (2011). Global health capacity and workforce development: turning the world upside down. *Infectious Disease Clinics of North America,* 25, 359-367.

Colvin, C.J., De Heer, J., Winterton, L., Mellenkamp, M., Glenton, C., Noyes, J., Lewin, S., & Rashidian, A. (2013). A systematic review of qualitative evidence on barriers and facilitators to the implementation of task-shifting in midwifery services. *Midwifery*, epub.

DeAngelis, S., Goral, V. (2000). Utilization of local anesthesia by Arkansas dental hygienists, and dentists' delegation/satisfaction relative to this function. *Journal of Dental Hygiene,* 74(3), 196-204.

Denmark, F.L. (2010). Prejudice and Discrimination. In I.B. Weiner & W.E. Craigheaid (Eds.), *The Corsini Encyclopedia of Psychology.* Volume Three (4th Ed., pp 1277). Hoboken, N.J.: John Wiley.

Dennis, S.M., May. J., Perkins, S., Zwar, N., Sibbald, B., & Hasan I. (2009). What evidence is there to support skill mix changes between GPs, pharmacists and practice nurses in the care of elderly people living in the community? *Australia and New Zealand Health Policy*, 6, 23.

Dierick-van Daele, A.T., Steuten, L.M., Metsemakers, J.F., Derckx, E.W., Spreeuwenberg, C., & Vrijhoef, H.J. (2010). Economic evaluation of nurse practitioners versus GPs in treating common conditions. *British Journal of General Practice,* 60(570), e28-35.

Douglas, T.J. & Ryman, J.A. (2003). Understanding competitive advantage in the general hospital industry: valuating strategic competencies. *Strategic Management Journal,* 24, 333-347.

Dyer, T.A., Brocklehurst, P., Glenny, A.M., Davies, L., Tickle, M., Issac, A., & Robinson, P.G. (2014). Dental auxiliaries for dental care traditionally provided by dentists. *Cochrane Database of Systematic Reviews,* 20;(8), CD010076.

Dyer, T.A. & Robinson P.G. (2008). Exploring the social acceptability of skill-mix in dentistry. *International Dental Journal,* 58(4), 173-180.

FDI (2016). Optimal oral health through inter-professional education and collaborative practice. FDI World Dental Federation. Version 5.1. 2015. Available at: http://www.fdiworldental.org/media/70740/collaborative-practice_digital.pdf. Retrieved October 15, 2016.

Finn, G., Garner, J., & Sawdon M. (2010). 'You're judged all the time!' Students' views on professionalism: a multicentre study. *Medical Education,* 44(8), 814-825.

Fiske, S.T. (1998). Stereotyping, Prejudice, and Discrimination. In D.T. Gilbert, S.T. Fiske, & L. Gardner (Eds.), *The Handbook of Social Psychology.* (Vol. 2, 4th Ed., pp. 357). Boston, Mass.: McGraw-Hill.

Fitzgerald, A. & Teal, G. (2004). Health reform, professional identity and occupational sub-cultures: the changing interprofessional relations between doctors and nurses. *Contemporary Nurse,* 16(1-2), 9-19.

Fones, A.C. (1929). Origin and history of the dental hygienists movement. *Journal Dental Hygiene,* 3(3), 7.

Freeth, D., Hammick, M., Reeves, S., Koppel, I., & Barr, H. (2005). *Effective interprofessional education: development, delivery and evaluation*. Oxford, UK: Blackwell.

Gillis, M.V. & Praker ME. (1996). The professional socialization of dental hygienists: from dental auxiliary to professional colleague. *National Dental Association Journal,*. 47(1), 7-13.

Ginsburg, S., Regehr, G., & Lingard, L. (2003). To be and not to be: the paradox of the emerging professional stance. *Medical Education,* 37(4), 350-357.

Glick, M., Monteiro da Silva, O., Seeberger, G.K., Xu, T., Pucca, G., Williams, D.M., Kess, S., Eiselé, J.L., & Séverin, T. (2012). FDI Vision 2020: shaping the future of oral health. *International Dental Journal,* 62(6), 278-291.

Goodrick, E. & Reay, T. (2011). Constellations of Institutional Logics: Changes in the Professional Work of Pharmacists. *Work and Occupations,* 38, 275–302.

Haaland, A. (1999). Mapping the literature of dental hygiene. *Bulletin of the Medical Library Association,* 87(3), 283-286.

Hafferty, F.W. (1998). Beyond curriculum reform: confronting medicine's hidden curriculum. *Academic Medicine,* 73, 403–407.

Hafferty, F.W. & Franks R. (1994). The hidden curriculum, ethics teaching, and the structure of medical education. *Academic Medicine,* 69, 861–871.

Hallett, T., Shulman, D., Fine, G. A., & Adler, P. (2009). *Peopling organizations: The promise of classic symbolic interactionism for an inhabited institutionalism.* The Oxford Handbook of Sociology and Organization Studies: Classic Foundations.

Hammick, M., Freeth, D., Copperman, J., & Goodsman, D. (2009). Being Interprofessional. Cambridge: Polity Press.

Hean, S. & Dickinson C. (2005). The Contact Hypothesis: an exploration of its further potential in interprofessional education. *Journal Interprofesional Care,* 19(5), 480-491.

Hean, S., MacLeod, C., Adams, K., & Humphris, D. (2006). Will opposites attract? Similarities and differences in students' perceptions of the stereotype profiles of other health and social care professional groups. *Journal of Interprofessional Care,* 20(2), 162–181.

Hogg, M.A., Terry, D.J., White, K.M. (1995). A Tale of Two Theories: A Critical Comparison of Identity Theory with Social Identity Theory. *Social Psychology Quarterly,* 58(4), 255-269.

Holmes, L. (2001). Reconsidering graduate employability: the graduate identity approach. *Quality in Higher Education,* 7, 111-120.

Hopcraft, M., McNally, C., Ng, C., Pek, L., Pham, T.A., Phoon, W.L., Poursoltan, P., & Yu, W. (2008). Attitudes of the Victorian oral health workforce to the employment and scope of practice of dental hygienists. *Australian Dental Journal,* 53(1), 67-73.

Hornby, S. & Atkins, J. (2000). Collaborative Care. Interprofessional, Interagency and Interpersonal. (Second Ed.), Oxford: Blackwell Science.

Huang, E.S. & Finegold, K. (2013). Seven million Americans live in areas where demand for primary care may exceed supply by more than 10 percent. *Health Aff (Millwood),* 32(3), 614-621.

Hurd, E. (2010). Confessions of Belonging: My Emotional Journey as a Medical Translator. *Qualitative Inquiry,* 16(10), 783-791.

Inglehart, M.R. (2013). Interactions between patients and dental care providers: does gender matter? *Dental Clinics of*

North America,. 57(2), 357-370.

Isenberg, D.J. (1986). Group Polarization: A Critical Review and Meta-Analysis. *Journal of Personality and Social Psychology,* 50 (6), 1141–1151.

Johnson, P.M. (2009). International profiles of dental hygiene 1987 to 2006: a 21-nation comparative study. *International Dental Journal*, 59(2), 63-77.

Kandelman, D., Arpin, S., Baez, R.J., Baehni, P.C., & Petersen, P.E. (2012). Oral health care systems in developing and developed countries. *Periodontology 2000,* 60(1), 98-109.

Kasperski, M. (2000). Toronto, ON: Ontario College of Family Physicians; 2000. Implementation strategies: 'Collaboration in primary care – family doctors and nurse practitioners delivering shared care' Available from: http://ocfp.on.ca/docs/public-policy-documents/implementation-strategies-collaboration-in-primary-care---family-doctors-nurse-practitioners-delivering-shared-care.pdf?sfvrsn=3 Retrieved December 28, 2016.

Khalili, H., Orchard, C., Laschinger, H.K., & Farah R. (2013). An interprofessional socialization framework for developing an interprofessional identity among health professions students. *Journal of Interprofessional Care*, 27(6), 448-453.

Kitchener, M & Mertz E. (2012). Professional projects and institutional change in healthcare: the case of American dentistry. *Social Science & Medicine*, 2012 Feb;74(3):372-80.

Knevel, R., Gussy, M.G., Farmer, J., & Karimi, L. (2017). Perception of Nepalese dental hygiene and dentistry students towards the dental hygienists profession. *International Journal of Dental Hygiene,* 15(3), 219-228.

Kreindler, S.A., Dowd, D.A., Dana Star N., & Gottschalk, T. (2012). Silos and social identity: the social identity approach as a framework for understanding and overcoming divisions in health care. *Milbank Quarterly,* 90(2), 347-374.

Langendyk, V., Hegazi, I., Cowin, L., Johnson, M., & Wilson I. (2015). Imagining alternative professional identities: reconfiguring professional boundaries between nursing students and medical students. *Academic Medicine,* 90(6), 732-737.

Lassonde, K. A., O'Brien, E. J. (2013), Occupational stereotypes: activation of male bias in a gender-neutral world. *J Appl Soc Psychol*, 43, 387–396.

Laurant, M., Harmsen, J., Wolersheims Grol, R., Faber, M., & Sibbald B. (2009). The impact of non physician clinicans: do they improve the quality and cost-effectiveness of health care services? *Medical Care Research and Review,* 66, 36S.

Laurant, M., Reeves, D., Hermens, R., Braspenning, J., Grol, R., & Sibbald, B. (2005). Substitution of doctors by nurses in primary care. *The Cochrane Database of Systematic Reviews*, 5, CD001271.pub2

Lempp, H. & Seale C. (2004). The hidden curriculum in undergraduate medical education: qualitative study of medical students' perceptions of teaching. *British Medical Journal,* 329(7469), 770-773.

Lingard, L., Garwood, K., Szauter, K., & Stern, D. (2001). The rhetoric of rationalization: how students grapple with professional dilemmas. *Academic Medicine,* 76(10), S45-47.

Luciak-Donsberger, C. (2003). The effects of gender disparities on dental hygiene education and practice in Europe. *International Journal of Dental Hygiene,* 1(4), 195-212.

Macdonald, K.M. (1995). *The Sociology of the Professions.* London: Sage.

Macey, R., Glenny, A., Walsh, T., Tickle, M., Worthington, H., Ashley, J. & Brocklehurst, P. (2015). The efficacy of screening for common dental diseases by hygiene-therapists: a diagnostic test accuracy study. *Journal of Dental Research,* 94(3), 70S-78S.

Macey, R., Glenny, A.M., Brocklehurst, P. (2016). Feasibility study: assessing the efficacy and social acceptability of using dental hygienist-therapists as front-line clinicians. *British Dental Journal,* 221(11), 717-721.

Mariño, R.J., Barrow, S.L., Morgan, M.V. (2014). Australian/New Zealand Bachelor of Oral Health students: sociodemographics and career decisions. *European Journal of Dental Education,* 18(3), 180-186.

Masella, R.S. (2006). The hidden curriculum: value added in dental education. *Journal of Dental Education,* 70(3), 279-283.

McComas, M.J. & Inglehart, M.R. (2016). Dental, Dental Hygiene, and Graduate Students' and Faculty Perspectives on Dental Hygienists' Professional Role and the Potential Contribution of a Peer Teaching Program. *Journal of Dental Education,* 80(9), 1049-1061.

McLean, H.M. & Kalin, R. (1994) Congruence between self-image and occupational stereotypes in students entering gender-dominated occupations. *Canadian Journal of Behavioural Science / Revue canadienne des sciences du comportement,* 26(1), 142-162.

Moffat, S. & Coates, D. (2011). Attitudes of New Zealand dentists, dental specialists and dental students towards employing dual-trained Oral Health graduates. *British Dental Journal,* 211(8), E16.

Monson, A.L. & Cooper B.R. (2009). Career influences and perceptions of pre-dental hygiene students. *Journal of Dental Hygiene,* 83(3):126-33.

Muroga, R., Tsuruta, J. & Morio, I. (2015). Disparity in perception of the working condition of dental hygienists between dentists and dental hygiene students in Japan. *International Journal of Dental Hygiene,* 13(3), 213-221.

Nancarrow, S.A. & Borthwick, A.M. (2005). Dynamic professional boundaries in the healthcare workforce. *Sociology of Health & Illness,* 27, 897–919.

Niezen, M.G. & Mathijssen, J.J. (2014). Reframing professional boundaries in healthcare: a systematic review of facilitators and barriers to task reallocation from the domain of medicine to the nursing domain. *Health Policy,* 117(2), 151-169.

Norris, P. (2001). How 'we' are different from 'them': occupational boundary maintenance in the treatment of musculo-skeletal problems. *Sociology of Health & Illness,* 23(1), 24–43.

Northcott, A., Brocklehurst, P., Jerkovic-Cosic, K., Reinders, J.J., McDermott, I., & Tickle, M. (2013). Direct access: lessons learnt from the Netherlands. *British Dental Journal,* 215(12), 607-610.

Ohlen, J., & Segestebn, K. (1998). The professional identity of the nurse: conceptanalysis and development. *Journal of Advanced Nursing,* 28(4), 720–727.

Olson, R. & Bialocerkowski A. (2014). Interprofessional education in allied health: a systematic review. *Medical Education,*

48(3), 236-46.

Owens, T.J., Robinson, D.T., & Smith-Lovin L. (2010). Three Faces of Identity. *Annual Review of Sociology,* 36, 477–499.
Pecukonis, E. (2014). Interprofessional education: a theoretical orientation incorporating profession-centrism and social identity theory. *The Journal of Law, Medicine & Ethics,* 42(2), 60-64.

Pereira, C., Bugalho, A., Bergstrom, S., Vaz, F., Cotiro, M.A. (1996). A comparative study of caesarean deliveries by assistant medical officers and obstetricians in Mozambique. *British Journal of Obstetrics and Gynaecology,* 103, 508-512.

Pervez, A., Kinney, J.S., Gwozdek, A., Farrell, C.M., & Inglehart, M.R. (2016). Education About Dental Hygienists' Roles in Public Dental Prevention Programs: Dental and Dental Hygiene Students' and Faculty Members' and Dental Hygienists' Perspectives. *Journal of Dental Education,* 80(9), 1071-1081.

Piipari, S.Y., Watt, A. Jaakkola, T., Liukkonen, J. & Nurmi, J. (2009). Relationship between physical education students' motivational profiles, enjoyment, state anxiety, and self-reported physical activity. *Journal of Sport Science and Medicine,* 8, 327-336.

Pirrie, A., Hamilton, S. & Wilson, V. (1999). Multidisciplinary education: some issues and concerns. *Educational Research,* 41(3), 301–314.

Powell, A.E. & Davies HT. (2012). The struggle to improve patient care in the face of professional boundaries. *Social Science & Medicine,* 75(5), 807-814.

Pratt, M.G., Rockmann, K.W., & Kaufmann, J.B. (2006). Constructing Professional Identity: The Role of Work and Identity Learning Cycles in the Customization of Identity among Medical Residents. *Academy of Management Journal,* 49, 235–262.

Richardson, M.S.C. (1999). Identifying, evaluating and implementing cost-effective skill mix. *Journal of Nurse Management,* 5, 265-70.

Ross, M. & Turner, S. (2015). Direct access in the UK: what do dentists really think? *British Dental Journal,* 218(11), 641-647.

Scholarios, D., Lockyer, C., Johnson, H. (2003). Anticipatory socialisation: the effect of recruitment and selection experiences on career expectations. *Career Development International,* 8(4), 182-197.

Sibbald, B., Laurant, M., & Scott, A. (2006). Changing task profiles. In R.B.. Saltman, A. Rico & W. Boerma (Eds.) *Primary Care in the Driver's Seat? Organizational Reform in European Primary Care.* (pp. 149-164). Maidenhead: Open University Press,

Sibbald, B., Shen, J., McBride, A. (2004). Changing the skill-mix of the health care workforce. *Journal of Health Services Research and Policy,* 9(1), 28-38.
Stets, J.E., Burke, P.J. (2000). Identity Theory and Social Identity Theory. *Social Psychology Quarterly,* 63(3), 224-237.

Swanson Jaecks, K.M. (2009). Current perceptions of the role of dental hygienists in interdisciplinary collaboration. *Journal of Dental Hygiene,* 83(2), 84-91.

Tajfel, H., & Turner, J.C. (1979). An integrative theory of intergroup conflict. In W.G.Austin, S.Worchel (Eds), The Social Psychology of Intergroup Relations (pp.33-47). Monterey, CA: Brooks-Cole.

Thomas, L.H., Cullum, N.A., McColl, E., Rousseau, N., Soutter, J. & Steen, N. (1999). Guidelines in professions allied to medicine. *Cochrane Database of Systematic Reviews*, 1, CD000349.

Tjia, J., Mazor, K.M., Field, T., Meterko, V., Spenard, A. & Gurwitz, J.H. (2009). Nurse-physician communication in the long-term care setting: perceived barriers and impact on patient safety. *Journal of Patient Safety,* 5(3), 145-152.

Tuckman, B.W. (1999). *A tripartite model of motivation for achievement: Attitude/drive/strategy.* Paper presented at the annual meeting of the American Psychological Association, Boston.

Turner, J.C. (1987). A Self-Categorization Theory. In J.C.Turner, M.A.Hogg, P.J.Oakes, S.D.Reicher, & M.S.Wetherell (Eds.). *Rediscovering the Social Group: A Self-Categorization Theory* (pp. 42-67). Oxford, UK: Blackwell.

Turner, J.C. & Reynolds, K.J. (2010). The Story of Social Identity. In T.Postmes & N.R.Branscombe (Eds.), *Rediscovering Social Identity: Key Readings.* (pp. 13-32). New York: Psychological Press.

Turner, S., Ross, M.K., Ibbetson, R.J. (2011). Dental hygienists and therapists: how much professional autonomy do they have? How much do they want? Results from a UK survey. *British Dental Journal,* 28;210(10), E16.

Vanderbilt, A.A., Isringhausen, K.T., Bonwell, P.B. (2013). Interprofessional education: the inclusion of dental hygiene in health care within the United States - a call to action. *Advances in Medical Education and Practice,* 30(4), 227-229.

Vliet Vlieland, T.P. & Hazes, J.M. (1997). Efficacy of multidisciplinary team care programs in rheumatoid arthritis. *Seminars in Arthritis and Rheumatism,* 27(2), 110-122.

Weaver. R., Peters, K., Koch, J., & Wilson, I. (2011). 'Part of the team': professional identity and social exclusivity in medical students. *Medical Education,* 45(12), 1220-1229.

Whittington, C. (2003). A model of collaboration. In J.Weinstein, C. Whittington & T. Leiba T (Eds.). *Collaboration in Social Work Practice.* (pp. 39-62). Londen: Jessica Kingsley, 2003.

Workman, B.A. (1996). An investigation into how the health care assistants perceive their role as 'support workers' to the qualified staff. *Journal of Advanced Nursing,* 23(3), 612-619.

World Health Organization (2008). Task Shifting: Rational Redistribution of Tasks Among Health Workforce Teams. Global Recommendations and Guidelines. World Health Organization, Geneva Switzerland; http://www.who.int/healthsystems/TTR-TaskShifting.pdf, Retrieved December 29, 2016.

Wright, S. C. (2009). Cross-group contact effects. In S. Otten, T. Kessler & K. Sassenberg (Eds.), *Intergroup relations: The role of emotion and motivation.* (pp. 262–283). New York, NY: Psychology Press.